High resolution map of aortic root tachycardia

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Case report

A 63-year-old woman without structural heart disease was referred with frequent and sustained episodes of atrial tachycardia. The episodes had terminated spontaneously before vagal manoeuvres or acute pharmacological intervention could be tried. Tachycardia with a cycle length 390–420 ms was induced. High-density electroanatomic mapping using the Carto mapping system and a pentaray mapping catheter revealed earliest right atrial activation in the interatrial septum close to the His bundle. Mapping of the left atrium via a patent foramen ovale showed activation in an adjacent position at similar timing, but nothing earlier. In the non-coronary aortic sinus, low-amplitude atrial electrograms preceded any right or left atrial electrogram by 20 ms (Figure 1). Radiofrequency ablation (SmartTouch surround flow catheter) at 20–30 W at this site terminated the tachycardia promptly. After a set of lesions in this site to an ablation index of 450, tachycardia remained non-inducible throughout the remainder of the procedure and clinically eliminated throughout 12 months of follow-up.

Discussion

Tachycardia arising from the atrial myocardium adjacent to the aortic root is a well-recognized clinical entity. This area is difficult to approach from the endocardial surface of the atrium, but responds well to ablation via the aortic root. The operator must appreciate the inter-relationship of the aortic root and the right and left atria.

Figure 1  The earliest atrial activation in tachycardia (A) was mapped to a site in the non-coronary sinus of Valsalva; electrograms at this site preceded all others by 20 ms. On the electroanatomic activation map viewed in a left anterior oblique projection (B), the site is in the middle of the cluster of red ablation markers. Ablation at this site terminated the tachycardia promptly (C).
Ablation of atrial tachycardia usually involves electrical mapping in just one chamber. In patients with focal AT arising close to or within the inter-atrial septum, high-density electroanatomical mapping of both atria and the aorta can be clinically useful. We have found the electroanatomic map produced in this case to be helpful in understanding the interrelationships between the relevant structures and we recommend it as a teaching aid (Supplementary material online, Video S1).

Supplementary material is available at Europace online.

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References